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Lessons Learned With ISO 14001 at DOE Sites

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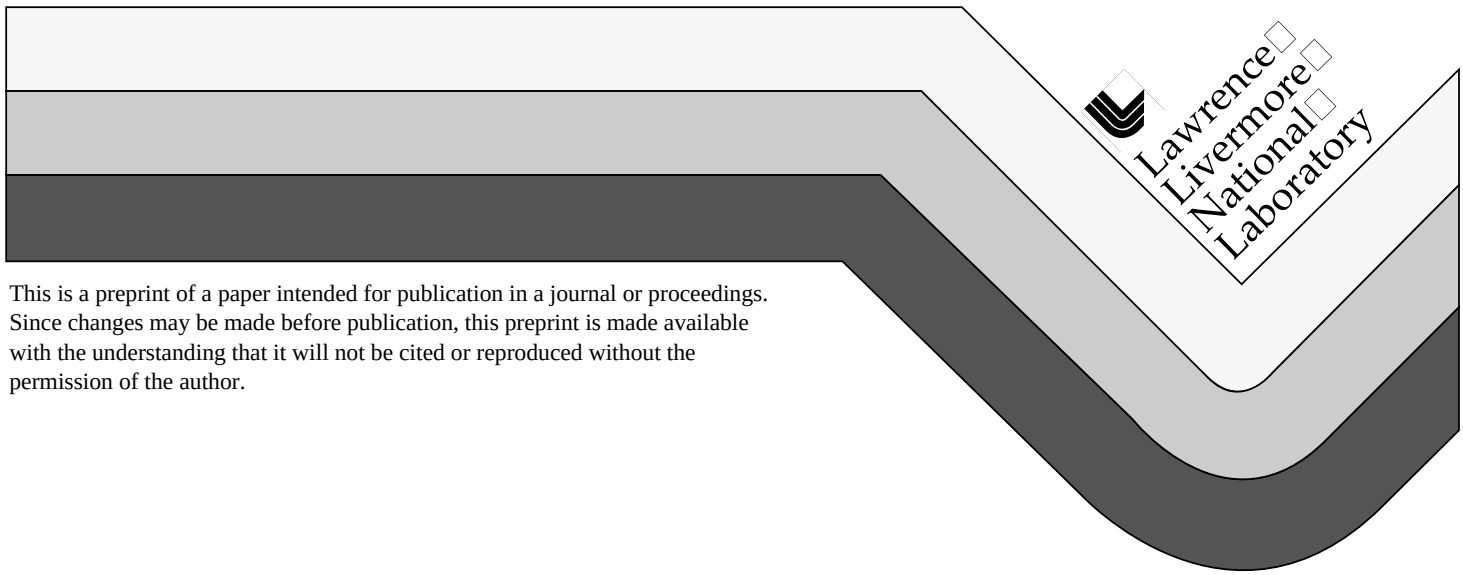

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LESSONS LEARNED WITH ISO 14001 AT DEPARTMENT OF ENERGY SITES

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ABSTRACT

ISO 14001 is the international standard for environmental management systems (EMS). The standard applies the "plan, do, check, act" management system model to assure that the environmental impacts of operations are fully considered in planning and facility operations. ISO 14001 has grown in popularity in both the public and the private sector and has seen increasing utility within the U.S. Department of Energy (DOE).

While there is no final DOE policy or requirement for ISO 14001 EMS implementation, ISO 14001 commands an active presence at many DOE sites. In general, the impetus for ISO 14001 in the DOE complex has been either an initiative by site management contractors to improve performance, or an actual requirement in the new management contracts for the sites. Several DOE sites now are committed to implement EMSs in conformance with ISO 14001:

- Brookhaven National Laboratory (BNL)
- Hanford
- Idaho National Engineering and Environmental Laboratory (INEEL)
- Kansas City Plant
- Nevada Test Site
- Savannah River Site (SRS)
- Waste Isolation Pilot Project (WIPP)
- West Valley

Several other DOE sites are expected to proceed in the near future with an EMS consistent with ISO 14001. However, not all sites are proceeding with an ISO 14001 EMS based on individual site business considerations. This paper describes the status of EMS implementation at these sites and identifies lessons learned that may be of use to other DOE sites.

INTRODUCTION

ISO 14001, adopted in September 1996, is the international standard for environmental management systems (EMS). The standard applies the "plan, do, check, act" management system model to assure that the environmental impacts are fully considered in planning and operating facilities.

The standard has generated a great deal of interest among both industries and governments. Industry generally expects that ISO 14001 will become a condition for doing business in the global marketplace, much like ISO 9000, the quality management standard. U.S. industry and federal and state regulators are also exploring the potential of ISO 14001 for a dual regulatory track in which facilities certified to ISO 14001 would be given some relief from the "command and control" systems.[1] In general, governmental agencies from across the globe recognize that EMSs are appropriate for use in governmental agencies, that EMSs can help control environmental liabilities, and that EMS can build on and integrate with other management systems. [2] These observations are now being demonstrated at DOE facilities as discussed in this paper. [3]

DOE Policy on ISO 14001

An early approach on ISO 14001 was to require DOE contractors to develop an ISO 14000-like EMS through a DOE-wide Order. Some contractors did not like the implication of the draft Order would 'require' a 'voluntary' standard. Although some viewed the draft Order as broad and flexible, the Order was never finalized. Likewise, largely due to a change of administration, DOE was not able to establish a formal Policy regarding ISO 14001.

The current approach within DOE is to encourage voluntary implementation of an environmental management system as an integrated component of the contractually-required Integrated Safety Management System (62 FR 34841).[4] Further, DOE encourages implementation of an environmental management system where it makes good business sense for the individual site. The voluntary

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[1] Because command-and-control is reaching a point of diminishing marginal returns, the federal government has been encouraged to employ a more flexible regulatory scheme with a greater reliance on an environmental management systems (Gibbons 1995 and NEPI 1995).

[2] These conclusions are an outcome from a 1998 international governmental meeting in Stockholm.

[3] US Federal agencies including DOE must now report environmental liabilities with their annual financial statements as required by the Government Management Reform Act(GMRA). Management of environmental liabilities under an ISO 14001 environmental management system will not be further discussed in this paper, but is scheduled to be discussed elsewhere in the 1998 NAEP conference under the ISO 14000 Track.

[4] The DOE Integrated Safety Management System (ISMS) is a process where by environment, safety, and health is integrated into work planning and business processes. "Safety" means "environment, safety, and health including waste management and pollution prevention (DOE P 450.4). ISMS contains the basic total quality management (plan, do, check, act) framework of ISO 14001.

approach is supported by the White House Office of Science and Technology Policy,[5] and the integrated approach has been recognized as acceptable by EPA.[6] DOE is also actively involved with the standard both at DOE sites and through an Interagency Working Group on ISO 14000. In addition, many DOE contractors are implementing ISO 14001 where it makes business sense for their individual site. Implementation is seen in a variety of ways from full third-party certification to implementation of various aspects of the standard. Following is a synopsis of the ISO 14001 activity at some of the DOE sites.

ALLIEDSIGNAL: KANSAS CITY PLANT

AlliedSignal Federal Manufacturing & Technologies completed its ISO 14001 registration audit for Kansas City Plant (KCP) in May 1997 and received certification in June 1997.[7] The DOE Kansas City Area Office has been fully supportive of implementing an ISO 14001 EMS at KCP. The Area Office included in the performance agreement with AlliedSignal a requirement to make successful application for ISO 14001 certification. The decision to have AlliedSignal proceed with certification, rather than self-declaring conformance to the standard, was made by the Area Office.

Development of an EMS

The ISO 14001 certification is for AlliedSignal operation of the KCP non-nuclear manufacturing facility which employs about 3,500 people. AlliedSignal manages approximately 130 of the 200 acre KCP site, with other contractors managing site facilities such as the wastewater treatment plant. While these other contractors are not currently proceeding with ISO 14001, AlliedSignal is including them in certain EMS functions, including training.

AlliedSignal formed a steering committee to establish a high-level action plan for the EMS. The key players were: senior management, line-operations personnel, environmental professionals, internal/external communications specialists, quality system representatives (ISO 9000) and internal auditors.

A gap analysis was conducted to identify areas where KCP's existing systems needed to be enhanced in order to conform to ISO 14001. An "element leader" was selected to assess existing systems in relation to each of the elements of ISO 14001. The 16 element leaders were subject matter experts in that particular part of the standard; for example, an emergency management expert was selected

[5] The White House Office of Science and Technology Policy supports standards-based environmental management, but urges that such approach must remain voluntary and should not become another burden imposed on top of other regulatory , permitting, and reporting requirements." (Gibbons, 1995)

[6] More discussion on this topic is provided in the "Brookhaven" section of this paper.

[7] The primary source of information regarding the Kansas City Plant was in presentations by David Huyett, AlliedSignal, to the Energy Facility Contractor Group (EFCOG) on ISO 14001, July 7-8, 1997 meeting, Washington, D.C.

for analyzing whether KCP had any gaps in conformance to that element of the standard. The element leaders performed the detailed gap analysis, developed action plans for filling the gaps and implemented the improvement actions.

KCP had a foundation for ISO 14001 based on AlliedSignal's existing ISO 9001 certification. Since ISO 9001 and ISO 14001 have many parallels, it was found that the basic document control mechanisms were already in place. The primary gaps in KCP's existing systems were: (1) the lack of an environmental policy; (2) the lack of an aspects analysis process, and; (3) the need to improve linkages and integrate environment, safety, and health with operations.

Environmental Policy

Senior management was very involved in developing the environmental policy. The objective was to develop a policy that was brief and simple, but meaningful. AlliedSignal incorporated their environmental management policy in a form that could be worn by all employees on their identification badge for quick reference and as part of the employee awareness program.

Aspects Analysis

AlliedSignal developed a methodology for its "aspects analysis" of KCP operations. ISO 14001 requires the organization to identify the environmental aspects of its activities, products, or services in order to determine those which could have significant impacts. AlliedSignal talked with the third party registrar about referring to existing environmental and safety documentation as the aspects analysis, but was directed to undertake a specific process for the EMS. In addition, the registrar emphasized that it would be important to consider the priorities of DOE and the regulators, but the aspects and impacts should be assessed on their own merits.

Approximately 19 KCP activities, including mechanical fabrication, plating, and printed wiring board fabrication, were identified by AlliedSignal in the aspects analysis. Activities were rated based on its environmental impacts on a scale of 0.1 to 100. Any activity rated as 10 or higher was designated as having significant impacts. Once an activity was identified as having significant impacts, operational controls and training needed to mitigate the impacts were considered. Objectives and targets were them set to track improvements. The aspect rating process considered the impacts of the activities under both normal operations and accident conditions and took into account the concerns of DOE, the regulators, and stakeholders. The aspects analysis will be reviewed on an annual basis.

Third-Party Registrar

AlliedSignal used the company, Det Norske Veritas (DNV), as the third party registrar for their ISO 14001 certification. Since DNV was their ISO 9000 registrar, they had an understanding with the KCP site operations and management systems. While DNV is based in Stockholm, the firm has offices in the United States and there were no problems with DNV in terms of understanding U.S. regulatory requirements. However, contracting with the third-party registrar was a challenge, and it took months to get the contract through the procurement process.

The certification process started with a one day meeting with the lead auditor in November 1996 to allow the opportunity for questions and answers and informal discussion to assure that AlliedSignal was generally on the right track. In January 1997, the pre-assessment session was held in order to bring the auditor up to speed on KCP operations.

The certification audit was held in May 1997. Periodic audits were scheduled every six months thereafter. The ISO 14001 and ISO 9001 audits will be held at the same time in order to minimize costs.

Costs of Certification

AlliedSignal did not track in-house costs for the gap analysis and certification process. They had two persons devoting about 80 percent of their time to the process for about a year, plus the time of the 16 element leaders during the gap analysis. It is expected that about one quarter FTE will be needed to maintain the EMS. The contract costs for the third party auditor were about $55,000.

Employee Awareness

AlliedSignal had an employee awareness program for the EMS. The effort was focused on assuring that employees are aware of the environmental policy, as stated on their badges, and the significant environmental aspects of operations, as determined through the aspects analysis. There was not much feedback from employees initially, but when the third party audit was approaching, there was a great deal of interest. Knowing that a third-party auditor was coming on-site to interview plant personnel made people very aware of the audit. Plant personnel wanted to know exactly what was to be expected and the appropriate responses to auditors. Plant-wide briefing sessions were conducted in preparation. Since KCP employs union workers, one lesson learned is that it is important to involve the union representatives in the process.

Stakeholder Involvement

Information about the ISO 14001 EMS was included in the KCP newsletter which is distributed to about 3,000 stakeholders. A survey on ISO 14001 was included in the newsletter but did not generate a great deal of interest.

Management Review

AlliedSignal conducted monthly environment, safety, and health (ES&H) meeting with senior managers as the forum for continuing management of the EMS. At these meetings, they reviewed audit results, assigned responsibility for corrective actions, and discussed the need for system changes.

Relation to Integrated Safety Management

The Integrated Safety Management System (ISMS) at the AlliedSignal Kansas City Plant is built on their existing ISO 14001 EMS and their Star Status in the Voluntary Protection Program (VPP).[8]

[8] The DOE VPP program is based on the Occupational Safety and Health Administration (OSHA) VPP program to formally recognize DOE contractor sites that are providing excellent safety and health programs.

KCP started work on its ISO 14001 EMS before DOE issued the DOE Policy 450.4 on Integrated Safety Management. AlliedSignal and the DOE Kansas City Area Office view their ISMS as:

ISMS = VPP + ISO 14001 + operating procedures + performance measures.

WESTINGHOUSE ELECTRIC CORPORATION: SAVANNAH RIVER, THE WASTE ISOLATION PILOT PLANT AND WEST VALLEY

Westinghouse Electric Corporation made a corporate decision in 1996 to implement ISO 14001 EMSs at is DOE sites. At the time Westinghouse was the M&O contractor at four sites: Hanford, SRS, WIPP, and West Valley. The Westinghouse Federal Programs manager directed the managers at the four sites to implement ISO 14001. In the fall of 1996, SRS, WIPP, and West Valley self-declared conformance to ISO 14001. (The Westinghouse Hanford contract ended about that time, so the EMS effort was not completed by the company, but was carried on by the new contractor.) SRS and WIPP then decided to proceed with official registration and in July 1997, both sites had registration audits. WIPP passed the audit and was officially registered as of August 5, 1997.[9] At SRS, the registrar found one nonconformance which was corrected.

Westinghouse saw third-party registration as an opportunity to demonstrate to its stakeholders that Westinghouse employed a modern, internationally recognized EMS further demonstrating that its operations are protective of human health and the environment, effective, and continually improving. In addition, the DOE Savannah River Operations Office also saw a competitive advantage with ISO 14001 certification over other DOE facilities. Specifically, because the Savannah River Site operates primarily for the DOE Office of Environmental Management (EM), the Savannah River Operations Office viewed ISO 14001 certification as a competitive advantage over other EM facilities such as the Idaho National Engineering and Environmental Laboratory (INEEL). The DOE Savannah River Operations Office hopes its certification to ISO 14001 will help make it the 'site of choice' for future EM missions.

The gap analysis was guided by a matrix of questions based on ISO 14001. While existing systems provided most elements of the EMS, some gaps were identified and corrected. In conducting the gap analyses for the three sites, Westinghouse found that three elements were extremely important. First, the top management support for the process at Westinghouse Federal Programs and among the Westinghouse senior managers at each site was essential for success. Top management was very visible throughout the process, making briefings and giving status updates. Second, they established cross-functional teams with people having operational, quality assurance, and ES&H responsibilities. The objective was to use existing personnel and avoid creating new bureaucracies, Third, the teams were provided with EMS training before the gap analysis was initiated. The training emphasized that it is not necessary for the EMS to be perfect from the start, and that continuous improvement is part of the objective.

[9] WIPP used the registrar, Advanced Waste Management, Inc. of Hixon, Tennessee.

Policy
Each site developed an environmental policy conforming to the standard. At Savannah River and Hanford, Westinghouse found that adopting one policy for the entire reservation was a useful approach. All of the contractor companies operating on the reservation signed the policy, although implementation within each of the companies may be different.

Aspects and Significant Impacts
Work was needed on the EMS requirements for operational aspects with significant impacts on the environment. Westinghouse developed a matrix documenting the reasons for identifying impacts as either significant or not, and listed the organizations involved with that aspect of operations. They also developed a matrix that listed the objectives, targets, and performance indicators for mitigating those impacts.

Training and Communication
Westinghouse found that personnel needed training in order to focus their thinking in terms of the environmental consequences of their work. Although the site has excellent Conduct of Operations training programs, employees did not automatically associate their work with potential environmental impacts. Training was conducted through routine safety meetings, newsletter articles, electronic mail, postings on bulletin boards, and through promotional gifts.

EMS Documentation
While DOE recordkeeping and documentation systems are generally sufficient for an ISO 14001 EMS, some 'packaging' was necessary to provide a roadmap between the parts of the existing system and the EMS(i.e., finding an effective format to describe how the various subsystems fit into the whole EMS system, and how the parts interrelate.) This was necessary to show that once aspects and impacts had been identified, objectives had been set, training had been provided, etc. Westinghouse developed a list of the required documents and records that would be needed for the EMS.

EMS Audits and Management Review
A new approach was needed for managers to review how the EMS is working as a system and what changes might be needed to assure continual improvement.

Westinghouse found that establishing their EMSs was a manageable process which could be handled as part of routine operations. The personnel involved generally spent no more than 20 percent of their time on the effort. They found corrective actions to be straightforward. They did not have to develop extensive new procedures and they did not find the documentation requirements onerous.

For the registration process, Westinghouse found that holding a pre-bid conference with potential registrars was useful. They also found that since ISO 14001 is a new process, the registrars may not always know the answers. When Westinghouse first approached registrars regarding WIPP, they did not think the site could be registered because it is not yet operational (accepting waste from other DOE sites). Westinghouse pursued the issue with the American National Standards Institute and it was decided that WIPP could indeed be registered to ISO 14001 prior to operations.

An additional consideration is the VPP Star Status of WIPP. Westinghouse reported that the VPP Star Status enhanced the EMS implementation process and that the ISO 14001 EMS and the VPP programs reflect the high level of understanding that excellent ES&H performance is required to maintain stakeholder confidence, and achieve safe and effective mission deployment.

Cost

The cost of registration was approximately $74,000 for SRS and $94,000 for implementation and registration at WIPP. Internal costs were not tracked but were considered part of normal job functions. The $94,000 at WIPP includes the gap analysis, the annual assessments of the EMS, outside technical support, promotional materials, the cost of the third-party registration audit, and estimated cost of two annual post assessments. The $74,000 at Savannah River was only for the third-party registration audit and annual surveillance audits. Estimates of internal costs were not provided.[10]

FLUOR DANIEL HANFORD

Hanford is now implementing its EMS as part of its Integrated Safety Management System (ISMS). The Fluor Daniel Hanford, Inc. contract required that the firm provide a written commitment to conduct business in a manner consistent with ISO 14001 and prepare an EMS Implementation Plan. Fluor Daniel took over the Hanford management contract just as Westinghouse was conducting an ISO 14001 gap analysis at the site. At about the same time, the planning for ISMS was proceeding separately from the EMS planning.

During the planning process, Hanford managers revisited the question of the separate EMS and ISMS.[11] They developed a matrix correlating system elements of ISO 14001, the DOE P 450.4 Safety Management System Policy, and the Hanford ISMS. They also developed a crosswalk that assesses the strength and weaknesses of the correlations of ISO 14001 with DOE P 450.4. One of the findings was that ISO 14001, with its strong emphasis on management review, would complement DOE P 450.4 and strengthen the ISMS. Hanford managers decided to integrate the EMS program within the ISMS as one single system that operates at all levels and provides a structured framework for integrating safety and environmental management into operations.

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[10] These costs do not include the cost for one full-time EMS coordinator responsible for the development of the EMS documentation, corrective actions from the gap analysis, and completion of employee training. In addition the WIPP Waste Isolation Division ISO Implementation Team (about 10 people) worked an average of two hours per week, with considerably more time required during the two month period prior to the registration audit. Overall development and implementation of the EMS took place over a 15 month period. (Information supplied by Tom DuPlessis, Westinghouse Corporate.)

[11] The primary sources of information on the integration of ISO 14001 with the ISMS at Hanford are the presentations by Paul J.Krupin, DOE/RL, and Gloria Cummins, Waste Management Federal Services Hanford, to the EFCOG Working Group on ISO 14001, July 7-8 meeting, Washington, D.C.

The Fluor Daniel ISMS Plan states, "the single integrated system developed for the ISMS is primarily based on philosophies, principles, and requirements of the DOE's *Safety Management System Policy* (DOE 450.4) and the specification and guidance for Environmental Management Systems (EMS) (ISO 14001 Standard)" (FDH 1997). The ISMS will serve as an umbrella for the EMS and other initiatives, including the Voluntary Protection Program, Enhanced Work Planning, Responsible Care® (Chemical Manufacturers Association), and the Radiological Control Improvement Plan.

LOCKHEED MARTIN IDAHO TECHNOLOGIES (LMITCO): IDAHO NATIONAL ENGINEERING AND ENVIRONMENTAL LABORATORY (INEEL)

INEEL is maintaining a focus on safety through the required DOE ISMS, but is placing more emphasis on the VPP as the umbrella framework through which to implement the integrated safety management system and ISO 14001 EMS. INEEL is working towards both VPP and ISO 14001 certification, and plans to integrate initiatives such as ISO 14001, VPP, and Enhanced Work Planning (EWP) into their integrated safety management system.

INEEL is seeking certification to ISO 14001 for a competitive advantage. While there is no corporate driver from Lockheed Martin to seek certification, the lab and the DOE customer (the DOE Idaho Operations Office) want the site to become certified to 'compete' with other DOE EM sites for funding and future missions. [12]

UNIVERSITY OF CALIFORNIA: LAWRENCE BERKELEY NATIONAL LABORATORY (LBNL)

Lawrence Berkeley National Laboratory (LBNL) is working to integrated the core elements of ISO 14001 into their ISMS. They are also working with the California Environmental Protection Agency (Cal/EPA) to participate in a state-wide ISO 14001 pilot project. The lab has submitted a proposal to participate in the state pilot project for the lab's hazardous waste handling facility. At this time, Cal/EPA has not yet issued a statement regarding acceptance of LBNL into the pilot. The Cal/EPA pilot would focus on EMS implementation and seek to gather data on environmental performance and compliance, public acceptance, pollution prevention, and cost.

[12] Statement by Richard Cullison (DOE Idaho Operations Office) at the DOE ISMS Lessons Learned Workshop, February 1998, Albuquerque, New Mexico.

BROOKHAVEN SCIENCE ASSOCIATES: BROOKHAVEN NATIONAL LABORATORY

Brookhaven National Laboratory recently underwent a change of management due problems associated with the discovery of tritium contamination in the water. New York State Attorney General Dennis Vacco called on Brookhaven to implement an ISO 14001-like environmental management system before he would recommend reopening the site (Cascio 1998). As part of the new contract for managing the site, the U.S. Environmental Protection Agency (EPA)[13] has required that the new contractor must attain "excellence" in its ES&H operations by using industry-based standards such as ISO 14001 and VPP. In addition, the new contractor will be required to obtain ISO 14001 third-party certification (for selected facilities) by September 2000 (preceded by a laboratory-wide self-declaration by April 2000). Their EMS must also include the provisions of the DOE Integrated Safety Management System (ISMS)which requires integration of environment, safety and health with work planning and business processes. As part of the compliance agreement, EPA also required that the EMS must emphasize compliance, pollution prevention, and community involvement. Through the Brookhaven experience, EPA seems to be comfortable with DOE's integrated ES&H management under ISMS. Further, EPA sees that the weaknesses in ISO 14001 (compliance, pollution prevention, and public involvement)[14] can be incorporated in and strengthened by integration of an EMS with the DOE ISMS.

BECHTEL NEVADA: NEVADA TEST SITE (NTS)

Bechtel Nevada at the Nevada Test Site has begun the process of developing an EMS. In accordance with the Bechtel Nevada contract, which refers to the need for a "structured ISO 14001 Environmental Management System framework," the site has formed an EMS Team. The EMS Team will guide the site through development and implementation of their EMS. Their target for implementation is fiscal year 1999.

LOCKHEED MARTIN ENERGY SYSTEMS: OAK RIDGE RESERVATION

In early 1997, Lockheed Martin Energy Systems (LMES) personnel performed a gap analysis to both ISO 9001 and ISO 14001. Except for a few minor areas, the assessments showed adequate flowdown to Energy Systems procedures. While the facilities are structuring their environmental management system to be in line with the DOE Integrated Safety Management System (ISMS), there is no corporate push at this time for Oak Ridge facilities to become certified to ISO 14001.

[13] "EPA" refers to EPA Region II, and the EPA National Enforcement Investigations Center (NEIC).

[14] EPA discusses its views on ISO 14001 in is Position Statement as published in the *Federal Register* on Thursday, March 12, 1998 (63 FR 12094-12097).

The DOE Oak Ridge Operations Office has recently procured a new Management and Integration (M&I) contractor to manage its environmental restoration and waste management services. The new contractor, Bechtel Jacobs, takes over April 1, 1998, and has not yet made a statement regarding ISO 14001 registration. It is likely that Bechtel Jacobs will operate under an integrated safety management system which will include an ISO-14000-like EMS. In addition, the DOE Oak Ridge Operations (DOE-ORO) management is considering ways to use an ISO 14001 EMS to improvement management practices across the geographically diverse sites under its jurisdiction.

GLOBAL ENVIRONMENTAL TECHNOLOGY FOUNDATION (GETF)

GETF has been working with the DOE Assistant Secretary for Environmental Management and the Office of Science and Technology Policy (OSTI) to determine how ISO 14001 can help technology deployment. GETF will work with two businesses as pilot projects to develop and implement an ISO 14001 EMS at each facility. Throughout the project, the organizations will track, collect, and record data about their activities, including benefits and challenges of the project, costs, business efficiencies, effect on market penetration, environmental performance, stakeholder involvement, and pollution prevention activities. These data will be made available through globeNet™ at http://www.iso14000.net. Information gathered and lessons learned during the life of the project will be used to create a DOE ISO 14001 Implementation Guide which can be used for other DOE organizations in developing and implementing their own EMS.

SITES NOT IMPLEMENTING ISO 14001

Not every site in the DOE complex is actively pursuing implementation of an ISO 14001 EMS. These sites have a variety of reasons not to implement an EMS. The reasons generally center on business reasons due to lack of customer or stakeholder requirements driving implementation. Some sites do not see a great enough benefit that justifies the cost of a gap analysis or certification. These sites feel they cannot justify the expense of time, money, and employee resources when faced with other more pressing compliance and safety issues.

Some sites are pursuing some level of EMS implementation, but are self-declaring conformance to the standard rather than paying for third-party certification. It is possible to reap the value of an ISO 14001 EMS (or "EMS-like system) without pursing third-party certification. However, public credibility and trust will likely be the strongest if independent (third-party) verification is employed (as opposed to self-declaration).

CONCLUSION

Many DOE sites have been implementing ISO 14001 at various levels to gain a competitive advantage and to build credibility with regulators and the public. DOE has recently required all of its contractors to implement an Integrated Safety Management System (ISMS). Because ISMS is

now a contractual requirement for doing business with DOE, all DOE contractors must recognize and implement an integrated environment, safety, and health (or "safety") management system. Many DOE contractors are using ISO 14001 as the environmental component of their ISMS. This approach has also been recognized by EPA as a workable approach for DOE sites. Still, however, full implementation of ISO 14001 is not a 'one-size-fits-all' approach for every DOE site. While some sites have completed or are striving for third-party certification, others will self-declare, and others will incorporate the basic tenets of an ISO 14001 EMS into their existing management system without formally calling attention to the ISO 14001 Standard. Regardless of the approach best suited for business considerations at each individual site, many lessons learned can be applied. These Lessons are discussed below.

LESSONS LEARNED

1. Existing systems and programs at DOE sites provide an excellent foundation for the ISO 14001 EMS; certification is feasible at reasonable cost.

2. The ISO 14001 EMS is a means to take a new look at operations with a focus on hazard reduction and pollution prevention. The ISO 14000 review of environmental aspects and impacts can be based on (in part) existing environmental and safety documentation, and other DOE initiatives and programs; but these documents alone do not provide sufficient input to adequately define the aspects and impacts of site operations required under an ISO 14001 EMS.

3. The process of conducting the EMS gap analysis and correcting the deficiencies improves ES&H integration with line operations which is a fundamental component of the DOE Integrated Safety Management System (ISMS).

4. ISO 14001 enhances implementation of the DOE Integrated Safety Management Systems (ISMS) process and addresses the DOE Acquisition Regulation (DEAR) Clause requirement to integrate environmental considerations with business management.[15]

5. EPA accepts the integration of EMS with the ISMS at Brookhaven as part of the compliance agreement. However, EPA wants the Brookhaven EMS / ISMS to provide emphasis on compliance, pollution prevention, and public involvement.

6. ISO 14001 places focus on the line organizations and line management consistent with current DOE trends to shift ES&H accountability to the line. Senior managers must provide top-level involvement, but workers and union personnel must also be informed and involved.

[15] The DOE Acquisition Regulations (DEAR) states: ". . . an SMS [safety management system] is intended to be the cornerstone of the . . . effort of integrating environment, safety and health into business systems and work management processes. . . ." (62 FR 34853)

7. ISO 14001 fulfills DOE's responsibility under the EPA Code of Environmental Management Principles (CEMP)[16]; DOE obligations under the National Technology Transfer and Advancement Act of 1995 (Public Law 104-113)[17]; and the DOE Strategic Plan to utilize the best in private sector business practices (DOE 1997).

8. Certification should not necessarily be the end goal. The process of implementing the EMS may bring substantial value to the organization without paying for third-party certification costs. Third-party certification to the standard may not always be necessary if third-party certification does not make business sense for the site (for example, sites in a closure mode). The value of the EMS may be harvested without pursuing certification. However, public credibility and trust may be enhanced through third-party certification (as opposed to self-declaration). Certification may send an important message of commitment to sound environmental management to stakeholders, customers, lenders, insurers and others.

9. ISO 14001 should not be mandatory for all DOE sites. Sites should make an informed decision regarding ISO 14001 based on individual site business considerations, and customer/stakeholder requirements.

10. Contract clauses or requirements have worked well to establish an "ISO 14000-like" environmental management system.

11. Conducting a pre-bid conference with potential registrars is useful for all parties to gain better understanding of objectives and methods.

12. For DOE sites with multiple contractors, an EMS is most effective when one overall environmental policy is established. All of the contractor companies on the site should ascribe to the same policy statement, but implementation techniques may vary from company to company.

[16] The EPA CEMP is implemented at DOE sites through the DOE Integrated Safety Management System (ISMS) approach (DOE 1996a).

[17] Public Law 104-113 requires federal agencies to use voluntary consensus standards (such as ISO 14001) where applicable (DOE 1996b, and NIST 1996).

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